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Fall Trumpeter Swan Survey
of the
High Plains Flock

Fall 2009



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Introduction

The annual fall trumpeter swan survey is conducted to determine production and distribution for a portion of the Interior Population of trumpeter swans called the High Plains Flock, in accordance with the Interior Population and High Plains Flock trumpeter swan management plans (1997 and 2005, respectively). Each plan outlines population objectives (VI-2 and A-1) and management strategies for monitoring population status, which includes aerial surveys in South Dakota and Nebraska. These surveys are part of a trumpeter swan monitoring program that spans over two decades to track abundance trends in the flock and condition of the wetlands swans inhabit.

Methods

The survey was conducted from August 31st to September 3rd, 2009. We assumed that movement of swans was limited within this time frame; thus, double counting of swans was deemed minimal or non-existent. An aerial cruise survey was completed using a Cessna 182 airplane, flying at elevations of 800 to 1000 ft AGL and at speeds of 120 knots. The weather conditions were favorable with clear skies, high winds of 15 to 25 mph on the ground, and temperatures 70 to 85° F.

When a potential swan was sighted, the survey biologists verified the species (ensuring it was not an American white pelican) and classified its age and social status. Swans were categorized as (1) pairs with or without broods, (2) singles with or without broods, (3) cygnets, or (4) groups. Adult and subadult birds were recorded as white birds, and gray birds were classified as cygnets. The survey biologist also evaluated habitat conditions (i.e., availability of food resources and water) from the air.

The traditional survey route included much of northwest Nebraska, southwest South Dakota, and Wyoming (Fig. 1). This year Wyoming (Colony site) was excluded from the route because there have been no swans sighted there for 7 years, and the distance to the survey site increases the expense of the survey substantially. The area can be monitored from the ground, and if swans return to Colony, that portion of the route may be reinstated.

Results

During the 2009 survey, biologists counted a record-high 523 swans in the High Plains Flock (HPF). This is an increase of 22% from the 2008 estimate (Fig. 2), and was primarily the result of a higher number of cygnets and breeding pairs observed (Table 1). The number of breeding pairs increased, and correspondingly so did the number of broods and average brood size. However, the number of non-breeding pairs remained relatively stable (71 to 72). The 2009 results are above the 20-year average for total birds (298 ± 21), white birds (213 ± 1), and cygnets (86 ± 6). The Flock continues to experience a positive growth rate of 4.8% annually from 1990 to 2009 (Fig. 3). The overall

production of cygnets increased this year and the index of production rate (i.e., cygnets/white birds) was (0.49) compared to the long-term average (0.44). The specific results for each category are listed in Table 1.

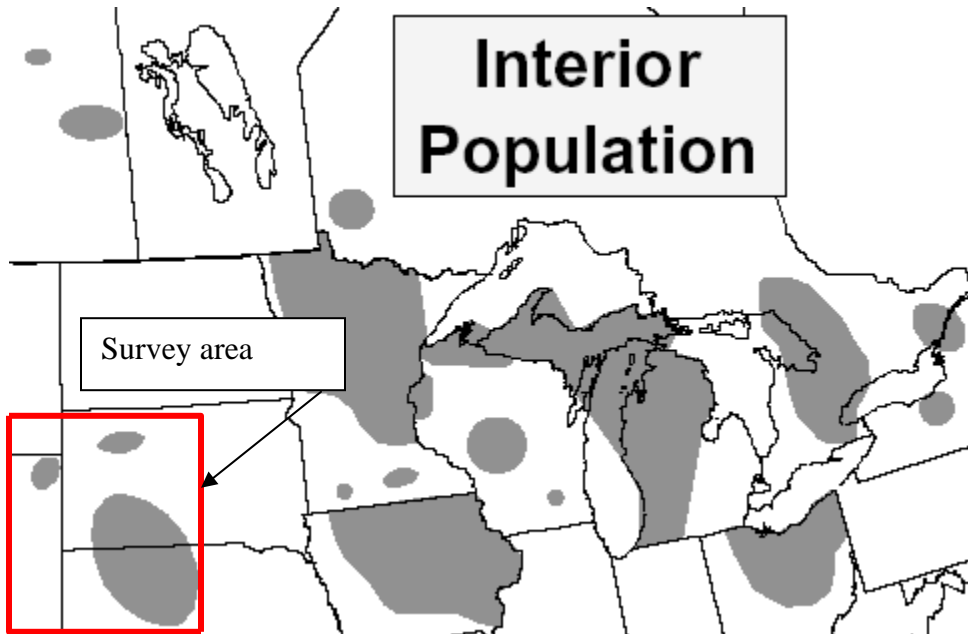


Figure 1. Survey area for High Plains Flock trumpeter swans located in southwest South Dakota and northwest Nebraska.

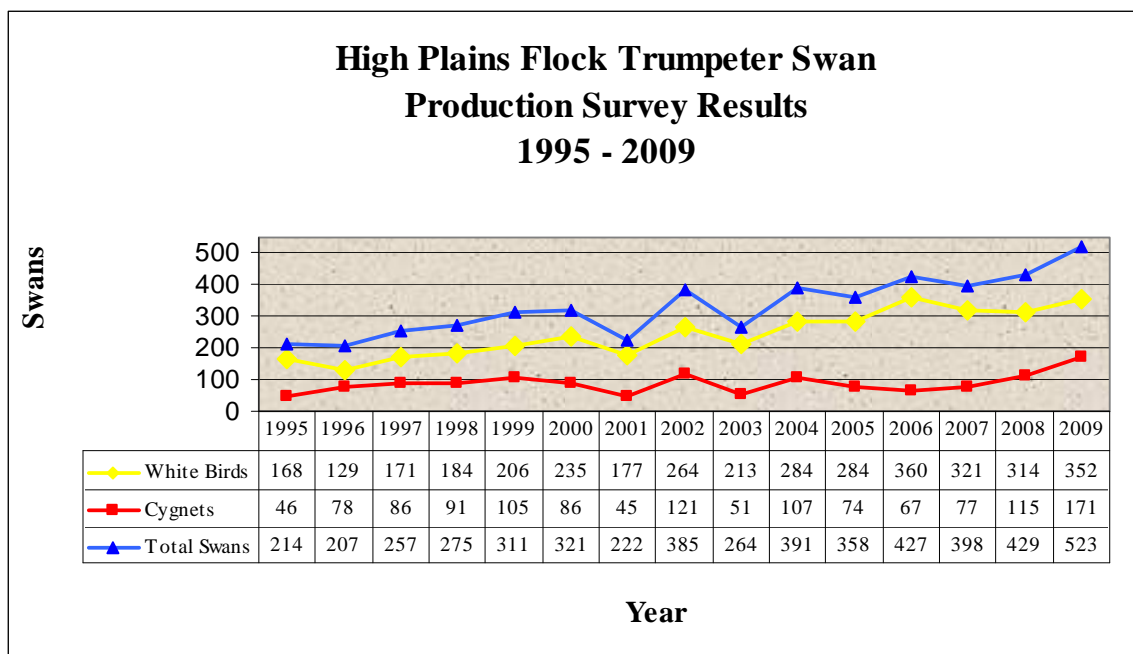


Figure 2. High Plains Flock Trumpeter Swan Production Survey Results 1995-2009.

Table 1. Results of the 2008 and 2009 fall production survey of High Plains Flock trumpeter swans.

Population parameter	2008	2009
Adults and subadults	314	352
Cygnets	115	171
Total swans	429	523
Adults and subadults in groups	72	71
Total flocks	13	15
Pairs with cygnets	42	60
Pairs without cygnets	71	72
Singles with cygnets	1	2
Singles without cygnets	15	17
Total broods	43	63
Mean brood size	2.67	2.73

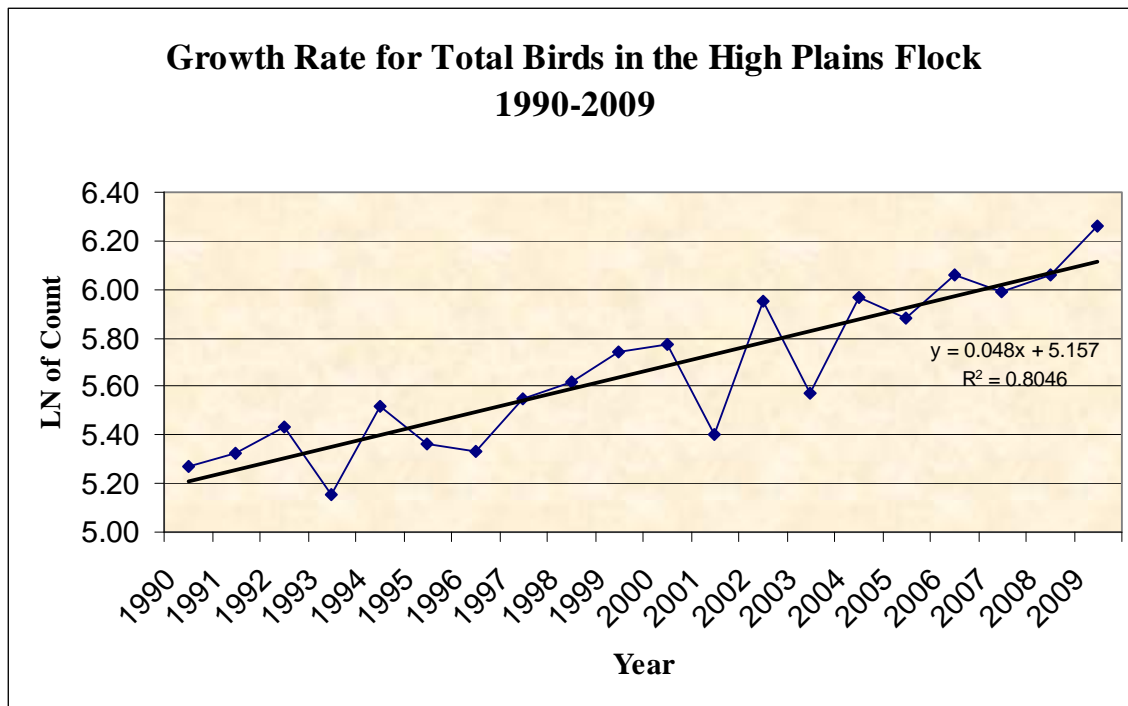


Figure 3. Growth rate of the HPF derived from the natural log of swans counted during fall production surveys from 1990 to 2009. The growth rate = 4.8% per year ($R^2 = 0.80$, $P = 0.00$).

Discussion

Habitat Conditions

Most of the breeding pairs were located on high quality wetlands (i.e., marshes with good water quality and food resources) within 80 miles of Lacreek National Wildlife in the Sandhills area. The water source for many of these wetlands is subsurface, thereby providing adequate water and food resources throughout the breeding season. This year

the majority of wetlands in the survey area contained some water, cover, and the subaquatic food resources appeared abundant (Fig 4). Precipitation in the survey area was mid-range or extremely moist from March to August, with the exception of May when the Palmer drought index indicated drought conditions over 2/3 of the breeding area; primarily in the Nebraska Panhandle. This is the second year precipitation conditions have been at or above normal (Fig. 5). Conditions continued to be favorable in the central and southeastern portions of the route, and swans have been expanding their range eastward according to Nebraska Game and Parks Commission personnel. Three years ago the route was extended farther east into the sandhills and biologists were counted additional birds (50) in those areas this year.



Figure 4. Wetland in the sandhills of Nebraska. Picture taken from the airplane during the survey, note three swans and one great blue heron.

Flock Status

The number of swans counted this year is the highest on record for the HPF and this was attributed to an increase in breeding pairs and cygnet production. All the production parameters for this flock increased, including the number of breeding pairs and average brood size. This increase in production could be attributed to the coinciding factors of a large number of white birds becoming reproductively active and an improvement in habitat quality. A swan may take up to four years to become reproductively active and in 2004 a relatively high number of cygnets were produced (107) making these birds

reproductively mature last breeding season. The increased precipitation levels improved habitat quality and provided many areas for breeding that may have been limited during the drought conditions. During the dry period many of the highest quality wetlands were likely occupied by established pairs that nest at these locations year after year. Thus, wetlands that provided marginal breeding habitat for newly established pairs during the drought may now be adequate for production. Still, the majority of the pairs observed had no cygnets, but the number of breeding pairs did increase 43% from last year.

The population objective for this flock is to develop a dispersed population consisting of at least 500 total birds counted during the production survey and 50 successful breeding pairs by 2010 (Comeau-Kingfisher and Koerner 2005). This goal of total birds and number of breeding pairs was achieved this year, and this is attributed to improvement of breeding habitat coinciding with the maturity of the 2004 hatch year age class. As long as habitat conditions remain favorable and no major stochastic event occurs, it is likely these parameters will continue to be achieved. If these conditions are not met, the population may drop below management objectives and adjust accordingly. It is likely that this population will fluctuate between 350 and 500 total birds, based on trend data and the current growth rate. Habitat availability in the sandhills is currently being modeled using data collected from previous surveys, and this should give managers an idea if there is enough habitat available for this flock to persist at the current objectives.

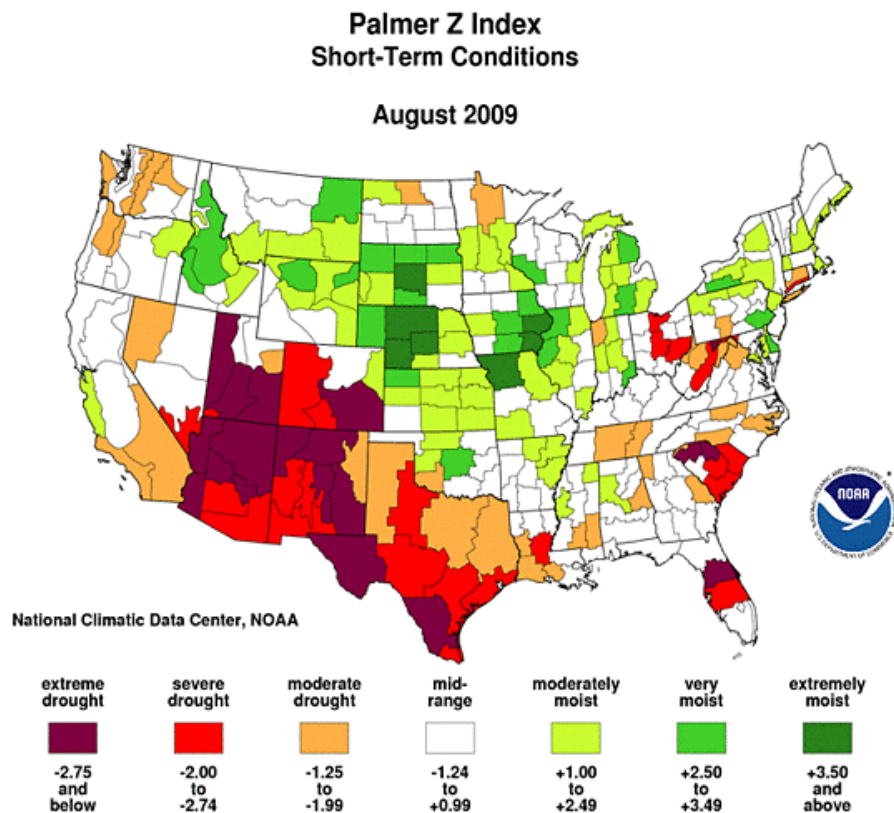


Figure 5. NOAA map of drought conditions the month of the survey.

References

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Appendix A. Survey results by location for the High Plains Flock, 2009 per day. W.B. = White bird (adult/subadult), N.B.P.= non-breeding pair, and B.P. = breeding pair.

		Swans			
W.B. Single	B.P.	Cyg.	N.B.P	Group	Comments
2	19	44	18	13	8/31/09 subtotal
7	19	47	25	21	9/1/09 subtotal
7	21	79	29	34	9/2/09 subtotal
1	1	1	0	3	9/3/09 subtotal
17	60	171	72	71	Survey Total